D H E C
PROMOTE PROTECT PROSPER
2600 Bull Street
Columbia, SC 29201-1708

DATE: September 20, 2005

SUBJ: Evaluation of Southern Wood Piedmont's status under the RCRIS Corrective Action Environmental Indicator Event Code CA750
SCD 049 690 001
Spartanburg County

FROM: Joe B. Bowers, P.G., Manager
RCRA Hydrogeology II Section
Division of Hydrogeology
Bureau of Land and Waste Management

THRU: G. Kendall Taylor, P.G., Director
Division of Hydrogeology
Bureau of Land and Waste Management

TO: Southern Wood Piedmont Project File
SCD 049 690 001

I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of Southern Wood Piedmont (SWP)'s status in relation to the following corrective action event codes defined in the Resource Conservation and Recovery Act Information System (RCRA Info):

Migration of Contaminated Groundwater Under Control (CA750).

Concurrence by the Director of the Division of Hydrogeology is required prior to entering this event code into RCRA Info. Concurrence with the interpretations provided in the following paragraphs and the subsequent recommendations is satisfied by dating and signing at the appropriate location within Attachment 1.

II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

There are two Environmental Indicator evaluations to which Southern Wood Piedmont is subject. The first evaluation determines if there is an unacceptable risk to Human Health (Human Exposures Under Control – CA725) and the second is a determination of whether the migration of contaminated groundwater is under control (Migration of Contaminated Groundwater Under Control – CA750). SWP received an initial evaluation for both of these

Environmental Indicators in September 1998, as described in a memorandum prepared by the

EPA Region 4 Office in Atlanta (see Jack to Taylor, dated 9/29/98). The September 1998 evaluation determined that SWP did not meet the CA725 or the CA750 Environmental Indicators, i.e., Human Exposures were not under control and Migration of Contaminated Groundwater was not under control.

The Department subsequently evaluated the SWP site to determine if Human Exposures were under control in August 2004 (see Bowers to Taylor, 8/20/04). At that time, it was determined that the site did meet the Human Exposures Under Control conditions and the site received a CA725 YE determination.

This memorandum evaluates whether the Migration of Contaminated Groundwater is under control. As noted above, EPA Region 4 conducted the first evaluation of the site in September 1998. Since that time, SWP has completed additional groundwater assessment and implemented remedial actions at the site. This evaluation is based on site conditions and available data available through August 2005.

The following references were used in preparation of this evaluation:

- Risk Assessment of Standing Stone Branch, dated November 1989
- Ground-Water Assessment of Standing Stone Branch, dated November 1991
- Risk Assessment for Standing Stone Branch, dated October 8, 1992
- 2002 Annual Ground-Water Quality Assessment Report, dated February 27, 2003
- 2003 Annual Ground-Water Quality Assessment Report, dated February 26, 2004
- Review of Risk Assessment of Standing Stone Branch (Memorandum from DuBois to Bergstrand, April 30, 2004)
- MW-10 Area Exploration Report, dated December 17, 2004
- 2004 Annual Ground-Water Quality Assessment Report, dated February 25, 2005
- 1st Semi-Annual 2005 Sampling Report, dated February 25, 2005
- MW-19 Area Remedial Effectiveness Report, dated August 25, 2005

III. FACILITY SUMMARY

SWP operated a wood treating plant in Spartanburg, S.C. beginning in 1923 until 1988 when operations ceased. The plant treated wood using both oil-based (creosote and pentachlorophenol) and acid-based (chromium, copper, arsenic) processes. Polynuclear aromatic hydrocarbons, volatile organic compounds, chromium, copper and arsenic are the main contaminants found at the site. Contamination has been found in the soil, groundwater, and stream sediments. The site is closed. SWP has submitted a RCRA Part B Permit Application for post closure care of the property, which is under review by the Department.

IV. CONCLUSION FOR CA725

This memorandum does not evaluate whether Human Exposures are under control at

SWP. Human Exposures were evaluated in a previous memorandum (see Bowers to Taylor,

dated 8/20/04) and were found to be under control. A code of CA725 YE has been entered into RCRA Info to indicate this determination.

V. CONCLUSION FOR CA750

Based on review of available data, the Migration of Contaminated Groundwater is Under Control. Groundwater is contaminated at the site above relevant regulatory levels, however, contaminated groundwater is not migrating significantly and is expected to remain within the current area of groundwater contamination. In addition, SWP has several groundwater corrective action systems operating at the site. The Department routinely evaluates the effectiveness of these systems in controlling the migration of contaminated groundwater.

VI. SUMMARY OF FOLLOW-UP ACTIONS

Groundwater at the site will continue to be monitored to confirm that it remains within the currently existing area of contamination. In addition, the Department will continue to work with the facility to ensure that the operating groundwater corrective action systems are operating and effective in remediating the site.

cc: Carlos Merizalde - EPA Region 4, Atlanta
Aubrey Stewart – EQC Region 2, Spartanburg

Attachment – Migration of Contaminated Groundwater Under Control Environmental Indicator

ATTACHMENT 1
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: **Southern Wood Piedmont**
Facility Address: **591 Springfield Road**
Spartanburg, S.C. 29304
Facility EPA ID #: **SCD 049 690 001**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   X If yes - check here and continue with #2 below,

   _____ If no - re-evaluate existing data, or

   _____ If data are not available, skip to #8 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993 (GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRA Info national database ONLY as long as they remain true (i.e., RCRA Info status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be "**contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

X If yes - continue after identifying key contaminants, citing appropriate "levels" and referencing supporting documentation.

____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated"

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Groundwater is contaminated at the site with a variety of organic and inorganic constituents. Some of the more common constituents detected in groundwater samples include, but are not limited to, naphthalene, phenanthrene, 1-Methylnaphthalene, dibenzofuran, acenaphthene, pentachlorophenol and other polynuclear aromatic hydrocarbons, as well as chromium. Most of the constituents detected do not have established MCLs, so the Department uses the EPA Region IX Preliminary Remediation Goals (PRGs) tap water values for comparison. All of these constituents have been detected at levels that greatly exceed their respective EPA Region IX PRGs for tap water. For example, samples collected in January 2005 indicate that naphthalene was detected in monitoring well PW-06 at 4.1 mg/l (or 4,100 parts per billion (ppb)) even though the sample had been diluted 50 times by the analytical laboratory. As a comparison, the tap water PRG for naphthalene is 6.2 ug/l (6.2 ppb). Likewise, chromium was detected in groundwater samples collected from MW-104 in January 2005 at 6.8 mg/l (6,800 ppb). The MCL for chromium is 0.1 mg/l, or 100 ppb.

It should be noted as well that there is significant Dense NonAqueous Phase Liquid (DNAPL) present at the SWP site. For example, DNAPL was measured in monitoring well MW-29 to be 15.39 feet thick, according to the 2004 Annual Groundwater Quality Assessment Report. DNAPL thickness ranged from less than a foot in MW-25B to that observed in MW-29.

[1]"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[6] as defined by the monitoring locations designated at the time of this determination?

__X__ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[6]).

____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Groundwater data from 2002 until present was reviewed with respect to this question. Based on review of available groundwater data, contaminated groundwater is not migrating significantly and is expected to remain within the current area of groundwater contamination. This determination is based on review of groundwater data at certain areas of the site. Specifically, review of groundwater data collected from monitoring wells in the vicinity of MW-10 and data from wells located in the vicinity of MW-19.

The area in and around MW-10 is of interest because it is located near the downgradient property boundary and adjacent to a surface water body, Standing Stone Branch. SWP conducted a more focused investigation of this area in 2003 and 2004. Numerous soil borings were installed and both soil samples and groundwater samples collected and analyzed. Groundwater samples were collected from approximately 25 temporary borings in this area. While groundwater contamination was detected from samples collected from these borings at levels greater than pertinent action levels, the concentrations detected are similar to historical data from monitoring wells in this area (e.g. MW-01A, MW-09, MW-9B, MW-10, MW-10A, MW-10B, MW-28, MW-28A, MW-28B, MW-54, MW-60, and MW-74). Furthermore, a groundwater sample collected across Standing Stone Branch from boring SB-27 did not indicate the presence of site constituents.

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[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

Groundwater data from the area of MW-19 was also reviewed. This area is of interest because it is located adjacent to the facility property boundary and near offsite residents. SWP has investigated this area with both soil borings and the installation of additional monitoring wells. Based on review of the data from wells in this area (MW-18, MW-18A, MW-19, MW-19A, MW-19B, MW-105, MW-106, and MW-107), the groundwater plume in this area appears to be stable. Of particular note are groundwater data from monitoring wells MW-105 and MW-106, located offsite of SWP. Groundwater samples collected from these wells in January 2005 did not detect hazardous constituents. These results are consistent with data collected from these wells since their installation in April 2003.

A corrective action system consisting of an ozone-enhanced air sparging system was installed in the MW-19 Area in 2002. While this system is primarily intended to treat hazardous constituents in soils above the water table, it is expected that operation of the system will have a positive impact on groundwater quality in this area as well.

Based on this evaluation, it does not appear that there is significant migration of contaminated groundwater beyond the existing area of groundwater contamination at the SWP site.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

__**X**__ If yes - continue after identifying potentially affected surface water bodies.

____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s)

Surface water and sediment samples were collected from Standing Stone Branch in 1989, 1990, and 1991. In summary, surface water samples did not contain significant concentrations of hazardous constituents. In addition, the Risk Assessment for Standing Stone Branch, dated October 8, 1992, concluded that due to the intermittent nature of this stream and the fact that no fish greater than five inches in length were observed in this section of Standing Stone Branch, the ingestion of fish would be an unlikely exposure scenario. Furthermore, as noted above, a recent review of available risk assessment date for Standing Stone Branch concluded that there doesn't appear to be a significant or unacceptable risk to off-site receptors exposed to the levels of contaminants found in Standing Stone Branch. Therefore, surface water is not reasonably suspected to be contaminated above risk-based levels.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be "**insignificant"** (i.e., the maximum concentration[7] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level" and there are no other conditions (e.g., the nature and number of discharging contaminants, or environmental setting) which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

__**X**__ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[7] of <u>key</u> contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) providing a statement of professional judgment/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[7] of <u>each</u> contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," providing the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identifying if there is evidence that the amount of discharging contaminants is increasing.

____ If unknown – enter "IN" status code in #8.

<u>Rationale and Reference(s):</u>

The discharge of contaminants from groundwater to surface water is likely to be insignificant as noted in the discussion included under question 4 above.

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[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable"** (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

   _____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
   2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

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[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable"**) - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

7. Will groundwater monitoring/measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

__X__ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination"

____ If no - enter "NO" status code in #8.

____ If unknown – enter "IN" status code in #8.

Rationale and Reference(s):

Yes, groundwater monitoring is ongoing and will continue at the site until such time that groundwater meets relevant standards (e.g. MCLs or tap water PRGs). The Department has approved a groundwater monitoring schedule that SWP is following. This schedule will remain in effect to ensure proper monitoring of all groundwater contamination at the site.

8. Check the appropriate RCRIS status codes for the "Migration of Contaminated Groundwater Under Control" EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__X__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **Southern Wood Piedmont** facility , **EPA ID # SCD 049 690 001**, located at **591 Springfield Road in Spartanburg, South Carolina**. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

____ IN - More information is needed to make a determination.

Completed by(signature) Joe B Bowers Date 9-20-05
(print) Joe B. Bowers
(title) Manager, RCRA Hydrogeology II Section

Supervisor (signature) G. Kendall Taylor Date 9-21-05
(print) G. KENDALL TAYLOR
(title) DIRECTOR, Div. of Hydrogeology LWM, SCDHEC

Locations where References may be found:

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